

Applicant(s): Myeong-cheol Kim, et al.  
U.S. Serial No.: 09/731,385

REMARKS

The drawings are objected to under 37 C.F.R. §1.83(a) as not showing every feature of the invention specified in the claims. Also, claims 12 and 13 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification. Claims 12 and 13 have been canceled. Accordingly, it is believed that the objection to the drawings and the rejections of claims 12 and 13 under 35 U.S.C. §112, second paragraph, are overcome.

Claim 1 is objected to because of an informality. The claim has been amended such that it is believed that the objection is overcome. Reconsideration of the rejection is requested.

Claims 1-15 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The specific language referenced by the Examiner has been corrected in the claims. Accordingly, it is believed that the rejections under 35 U.S.C. §112, second paragraph, have been overcome, and reconsideration of the rejections is requested.

Claims 1 and 3-7 have been rejected under 35 U.S.C. §102(e) as being anticipated by Huang (U.S. Patent Number 5,899,722). Claims 1, 3-8, 10 and 15 have been rejected under 35 U.S.C. §102(b) as being anticipated by Chang, et al. (U.S. Patent Number 5,817,562). Claims 2, 9, and 11-13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Chang, et al. Claim 14 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Hwang. In view of the amendments to the claims and the following remarks, those rejections are respectfully traversed, and reconsideration of the rejections is requested.

The claims are amended to more clearly and specifically recite features of the invention. Referring to Figure 1, which illustrates one embodiment of the amended claims, the device of the invention includes a first insulating layer 8 which fills gaps between conductive patterns 4. A second insulation layer 10, having a spacer shape, is formed over the first insulation layer. The first and second spacer layers are made of different insulating materials. As a result, the second insulation layer formed of material appropriate as a spacer is used in formation of the self-aligned

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contact in the second conductive layer 16. Simultaneously, the first insulation layer 8 made of a different insulating material provides characteristics which enhance the performance of the resulting device such as, for example, reduction of voids in the insulating material.

The claims are amended to more specifically recite this particular structure of the device of the invention. It is believed that this clarifying language now set forth in the amended claims serves to patentably distinguish the cited prior art.

Referring to the Huang patent, the disclosed device does not teach or suggest the structure now set forth in the amended claims. Specifically, there is not shown or suggested in Huang the claimed first and second insulation layers, wherein the second insulation layer has a spacer shape and is formed over the first insulation layer, the first and second insulation layers being formed of different insulating materials.

Referring to Chang, et al., the disclosed device also fails to teach or suggest the structure of the claimed invention, including the first and second insulation layers made of first and second insulating materials and the second insulation layer having a spacer shape being formed over the first insulation layer. The Examiner refers to item 24 of Chang, et al. as the first insulation layer filling a gap between adjacent conductive layer patterns. However, referring to column 6 lines 10 through 12, item 24 is a polysilicon oxide layer grown on the sidewalls of a polysilicon layer 16. It is not an insulating material layer used to fill gaps between adjacent conductive layer patterns, as claimed by the applicants. On the contrary, it is a thin layer formed on layer 16. Also, items 26 and 28 of Chang, et al. are spacers formed over the layer 24. Hence, layer 24 is not filling gaps between adjacent conductive patterns, as claimed by the applicants.

Since Huang and Chang, et al. fail to teach or suggest the invention claimed by the applicants in the amended claims, reconsideration of the rejections of the claims under 35 U.S.C. §§102(e), 102(b) and 103(a) is respectfully requested.


Attached hereto is a marked-up version of the changes made to the application by the current Amendment. The attached pages are captioned "Version with Markings to Show Changes Made."

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In view of the amendments to the claims and the foregoing remarks, it is believed that all claims pending in the application are in condition for allowance, and such allowance is respectfully solicited. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Version with Markings to Show Changes Made

In the Claims

Claims 12 and 13 have been canceled.

The claims have been amended as follows:

1. (Amended) A semiconductor device having a self-aligned contact, the semiconductor device comprising:

a plurality of conductive patterns formed to be adjacent to one another by sequentially stacking and patterning a first conductive layer and a mask layer on a particular underlying layer;

a first insulation layer filling a gap between adjacent conductive layer patterns [such that the upper portion of each conductive layer pattern is exposed], the first insulation layer being formed of a first insulating material;

a second insulation layer having a spacer shape, the second insulation layer formed [on] at the sides of each conductive layer pattern [exposed above the first insulation layer] and over the first insulation layer, the second insulation layer being formed of a second insulating material different from the first insulating material; and

a second conductive layer filling a contact hole which is self-aligned with respect to the second insulation layer[s] between adjacent conductive layer patterns [and which passes], the contact hole passing through the first insulation layer.